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PATENT APPLICATION
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Matthias KRULL et al.

Docket:	2000DE441D
Serial No.: 10/606,095	Group Art Unit: 1714
Filed: June 25, 2003	Examiner: Toomer, C.

For: **FUEL OILS HAVING IMPROVED LUBRICITY COMPRISING MIXTURES OF FATTY ACIDS WITH PARAFFIN DISPERSANTS, AND A LUBRICATION-IMPROVING ADDITIVE**

DECLARATION UNDER 37 CFR 1.132

Mail Stop
Amendment
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir:

I, Matthias Krull, state that I am a resident of Am Rheinhessenblick 27, D-55296 Harxheim, Federal Republic of Germany; that I am a citizen of the Federal Republic of Germany; that I am a chemist having earned the degree of Dr. rer. nat. (corresponds to Ph. D.) from the Free University Berlin, Federal Republic of Germany, in 1989.

I am acquainted with the subject matter of the above subject Application and I am one of the named inventors of Application No. 10/668,005, filing date of September 22, 2003 in the name of Matthias Krull et al. for "FUEL OILS HAVING IMPROVED LUBRICITY COMPRISING MIXTURES OF FATTY ACIDS WITH PARAFFIN DISPERSANTS, AND A LUBRICATION-IMPROVING ADDITIVE."

I have been employed for 17 years in the Research and Development department of Hoechst AG, Frankfurt, Germany, which was succeeded by Clariant GmbH, Frankfurt, Germany, where my work has focused on oilfield chemicals and especially on cold flow additives for mineral oils.

The following experiments were undertaken under my direction. A variety of cold flow improvers selected from the list of materials which were disclosed in the Japanese reference (JP 11-001692) were tested in comparison to the polar nitrogen-containing compound B1) of the subject application to assess the cold flow improvement of fatty acid mixtures and their solutions in organic solvents.
The materials used were the following:

Fatty Acids:

A3) Tall oil fatty acid comprising 29 % oleic acid, 64 % linoleic and other polyunsaturated acids and 3 % of saturated acids.
Iodine number 158 gI/100g. (similar to A1 of the subject application)

A4) Oleic acid (technical grade) comprising 67 % oleic acid, 11 % linoleic acid, 5 % of hexadecenoic acid and 12 % of saturated fatty acids.
Iodine number 85 gI/100g. (similar to A2 of the subject application)

Polar Nitrogen-Containing Compound:

B1) Product of the reaction of a terpolymer of $C_{14}/_{16}$-α-Olefin, maleic anhydride and allylpolyglycol with 2 equivalents of ditallow fatty amine, 50 % active in aromatic naphtha. This is the same polar nitrogen-containing compound as disclosed as B1 in the subject application.

Other Typical Cold Flow Improvers:

B9) EVA copolymer. (27 wt.-% vinyl acetate, molecular weight of 13.000), 50 % active in aromatic naphtha (comparison).

B10) Poly(tallow fatty ester of acrylic acid) (molecular weight of 75.000), 50 % active in aromatic naphtha (comparison).

B11) Behenic acid diester of poly(ethylene glycol) with molecular weight 600, 50 % active in aromatic naphtha (comparison).

In order to compare the differences between the low-temperature properties of compositions according to the subject application with fatty acid compositions containing fatty acids and other cold flow improvers (for example: B9, B10 and B11),

the pour points (see Table 1), cloud points (see Table 2) and storage stabilities (see Table 3) of these compositions were assessed. Pour points were measured in accordance with ISO 3016 and cloud points were measured in accordance with ISO 3015. The additive mixtures were then stored for 24 hours at -20 °C, and subsequently assessed visually (Table 3). (C) denotes comparative examples.

Table 1: Pour points of the additives

Example	Composition (parts by weight)					Pour Point [°C]
	A1	B1	B9	B10	B11	
1	80	20				-9
2	50	50				-27
3	20	80				-3
4 (C)	80		20			0
5 (C)	50		50			3
6 (C)	20		80			+12
7 (C)	80			20		-3
8 (C)	50			50		6
9 (C)	20			80		+15
10 (C)	80				20	0
11(C)	50				50	+12
12 (C)	20				80	+18
13 (C)	100					-6
14 (C)		100				+9
15 (C)			100			+18
16 (C)				100		+15
17 (C)					100	+21

Table 2: Cloud Points of the fatty acid solutions

For these examples the fatty acid was used as a formulation containing 50 % by weight of fatty acid in aromatic naphtha

Example	Composition (parts by weight)					Cloud Point [°C]
	A1	B1	B9	B10	B11	
18 (C)	100					-28.5
19	99,95	0,05				-34,0
20	99,8	0,2				-35.0
21	99,5	0,5				-33,5
22 (C)	99,8		0,2			-27.5
23 (C)	99,8			0,2		-29.0
24 (C)	99,8				0,2	-27.0

Table 3: Storage stability of the additives (storage for 24 hours at -20°C)

Example	Composition (parts by weight)					Assessment
	A2	B1	B9	B10	B11	
25 (C)	100					solid
26 (C)		100				solid
27 (C)			100			solid
28 (C)				100		solid
29 (C)					100	solid
30	80	20				liquid
31	50	50				liquid
32(C)	80		20			viscous gel
33 (C)	50		50			solid
34 (C)	80			20		viscous gel
35 (C)	50			50		solid
36 (C)	80				20	solid
37 (C)	50				50	solid

The resulting lower pour points of the fatty acids when combined with component B1, according to the subject application, over a broad range of concentrations clearly show that the additives disclosed in the subject application can be handled and used at much lower temperatures than neat fatty acids or fatty acids which are combined with other cold flow improvers. Similarly, after dilution of the fatty acids with solvent, the onset of crystallization as determined by the cloud point can be shifted to lower temperatures by introducing the additive components of the subject application. Thus, additive concentrates comprising fatty acids, solvent and minor amounts of Applicant's polar nitrogen-containing compounds, according to the subject application, can be stored and handled at lower temperatures than neat fatty acid solutions or fatty acid solutions containing other flow improvers without the risk of sediment formation or filter blocking. Furthermore, the above results show that compared to combinations of the fatty acids and any other well-known cold flow improvers of the Japanese Reference, the fatty acids when combined with Applicant's polar nitrogen-containing compounds, according to the subject application, do not gel or solidify during prolonged storage at low temperatures. Thus, the additive concentrates of the subject invention can be handled and used without prior heating or dilution, even after storage at low temperatures. These measurements show the superior properties of the claimed additive concentrates for stabilizing fatty acids at low temperature in comparison to other known middle distillate cold flow improvers cited in the Japanese Reference (JP 11-001692).

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Frankfurt am Main,

Date: 21.02.2007

Matthias Krull